UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2011/2012

COURSE NAME	:	REAL TIME SYSTEM
COURSE CODE	:	BIT 3333/ BIT 33303
PROGRAM	:	BACHELOR OF INFORMATION TECHNOLOGY
EXAMINATION DATE	:	JUNE 2012
DURATION	:	3 HOURS
INSTRUCTION	:	ANSWER **ALL** QUESTIONS.

THIS QUESTION PAPER CONSISTS OF FOUR (4) PAGES

Instruction: Answer **ALL** questions.

Q1   List **TWO (2)** methods to prevent Deadlock happen in a system.

(2 marks)

Q2   State the main difference between computer architecture and computer organization.

(2 marks)

Q3   State the main difference between Reliability and Availability in Fault Tolerance.

(2 marks)

Q4   Discuss **TWO (2)** important criteria to develop network design for real time system application.

(4 marks)

Q5   Justify, why Fault Tolerance becomes a major focus of the initial design for the internet.

(2 marks)

Q6   Construct a table that qualitatively compares **FOUR (4)** redundancy schemes which are hardware redundancy, information redundancy, time redundancy and software redundancy. The comparison criteria should be used are cost, performance, flexibility and faults tolerated.

(16 marks)

Q7   State of probability failure for two version of the program is given in the following **Table Q4**.

Table Q4: Probability Failure for Two Versions

Version	S1	S2
V1	0.001	0.003
V2	0.002	0.0003

S1 and S2 are the partitions of the input space and the probability of the input space in S1 is 0.25 and S2 is 0.75.

(a)   Calculate the probability of failure for version V1 and V2 in **Table Q4**.

(10 marks)

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(b)   If both V1 and V2 are independent, calculate the probability of failure for the program in **Table Q4**.

(4 marks)

(c)   If both V1 and V2 is actual joint, calculate the probability of failure for the program in **Table Q4**.

(4 marks)

Q8   Given the following case study:

A circular rail network consists of three tracks. Each track is in one of the following states:

- Busy, i.e., there is a train on the track.
- Claimed, i.e., a train has successfully requested access to the track.
- Free, i.e., neither busy nor claimed.

There are two trains driving on the circular track. The track where a train resides is busy. To move to the next track a train first claims the next track. Only free tracks can be claimed. Busy tracks are released the moment the train moves to another track. One can abstract from the identity of trains only the state of the rail network is considered.

(a)   Draw a model for **ONE (1)** rail network in terms of Petri net.

(10 marks)

(b)   Draw a model for **TWO (2)** rail network in terms of Petri net.

(21 marks)

Q9   (a)   List **THREE (3)** advantages of process scheduling.

(3 marks)

(b)   Discuss **TWO (2)** differences between Preemptive Scheduling and Non-preemptive Scheduling.

(4 marks)

(c)   The following **Table Q6** has a set of processes having their Burst Time mentioned in millisecond and arrived almost at the same time for Round Robin Scheduling. Time Slice = 2.

Table Q6: Process versus Burst Time

Process	Burst Time
P1	10
P2	5
P3	2

(i)   Draw a Gantt chart for overall processes in **Table Q6**.

(4 marks)

(ii)   Calculate a Waiting Time for P1, P2 and P3 in **Table Q6**.

(8 marks)

(iii)   Calculate an Average Waiting Time for the overall processes in **Table Q6**.

(4 marks)